

JAPANESE STALK-EYED CRUSTACEANS.

By MARY J. RATHBUN,

Second Assistant Curator, Division of Marine Invertebrates.

The collection here described was obtained by Dr. David S. Jordan and Mr. J. O. Snyder during the summer of 1900, while making a special investigation of the fishes of Japan under the auspices of the Hopkins Laboratory of Stanford University. The specimens were taken along shore, mostly in the seine. The new species number nine shrimps and one hermit crab. To show the relation of the species of *Parapenæus* of the *velutinus* type, descriptions of two additional species in the U. S. National Museum are included.

The drawings were made by Miss Sigrid Bentzon. The type specimens are in the U. S. National Museum.

Order DECAPODA.

Suborder BRACHYURA.

Family OCYPODIDÆ.

EUCRATE CRENATA de Haan.

Cancer (Eucrate) crenatus DE HAAN, Fauna Japon., Crust., 1835, p. 51, pl. xv, fig. 1.

Eucrate crenata ALCOCK, Jour. Asiatic Soc. Bengal, LXIX, 1900, p. 300, and synonymy.

Wakanourā, Kii; 2 males, 1 female.

CARCINOPLAX LONGIMANUS (de Haan).

Cancer (Curtonotus) longimanus DE HAAN, Fauna Japon., Crust., 1835, p. 50, pl. vi, fig. 1.

Carcinoplax longimanus ALCOCK, Jour. Asiatic Soc. Bengal, LXIX, 1900, p. 303, and synonymy.

Wakanoura, Kii; 4 males, 3 females, large; 15 males, 13 females, medium.

CARCINOPLAX VESTITA (de Haan).

Cancer (Curtomotus) vestitus DE HAAN, Fauna Japon., Crust., 1835, p. 51, pl. v, fig. 3.

Carcinoplax vestitus MILNE EDWARDS, Ann. Sci. Nat. (3), Zool., XVIII, 1852, p. 164 [128].

Wakanoura, Kii; 6 males, 3 females.

Family GRAPSIDÆ.**HEMIGRAPSUS SANGUINEUS (de Haan).**

Grapsus (Grapsus) sanguineus DE HAAN, Fauna Japon., Crust., 1835, p. 58, pl. XVI, fig. 3.

Heterograpsus sanguineus MILNE EDWARDS, Ann. Sci. Nat. (3), Zool., XX, 1853, p. 193 [159].

Tokyo, 9 males; Misaki, Sagami, 1 male; Wakanoura, Kii, 1 female.

ERIOCHEIR JAPONICUS de Haan.

Grapsus (Eriocheir) japonicus DE HAAN, Fauna Japon., Crust., 1835, p. 59, pl. XVII.

Eriocheirus japonicus MILNE EDWARDS, Ann. Sci. Nat. (3), Zool., XX, 1853, p. 176 [142].

Aomori, Rikuoku; Same, Rikuoku; Wakanoura, Kii; Chikugo River, Kurume, Chikugo.

PLATYGRAPSUS DEPRESSUS (de Haan).

Grapsus (Platynotus) depressus DE HAAN, Fauna Japon., Crust., 1835, p. 63, pl. VIII, fig. 2.

Platygrapsus depressus STIMPSON, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 104 [50].

Hakodate, Hokkaido.

SESARMA (HOLOMETOPUS) HÆMATOCHEIR (de Haan).

Grapsus (Pachysoma) hæmatocheir DE HAAN, Fauna Japon., Crust., 1835, p. 62, pl. VIII, fig. 4.

Holometopus hæmatocheir MILNE EDWARDS, Ann. Sci. Nat. (3), Zool., XX, 1853, p. 188 [154].

Mogi, near Nagasaki.

Family PILUMNIDÆ.**LIAGORE RUBROMACULATA de Haan.**

Cancer (Liagore) rubromaculatus DE HAAN, Fauna Japon., Crust., 1835, p. 49, pl. v, fig. 1.—BERTHOLD, Abh. Königl. Ges. Wiss. Göttingen, III, 1845, p. 18.

Wakanoura, Kii; 16 males, 9 females.

ATERGATIS OCYROE (Herbst).

Cancer ocyroe HERBST, Natur. d. Krabben u. Krebse, III, Pt. 2, 1801, p. 20, pl. LIV, fig. 2.

Atergatis floridus ALCOCK, Jour. Asiatic Soc. Bengal, LXVII, 1898, p. 98, and synonymy.

Misaki, Sagami.

XANTHO SCABERRIMUS Walker.

Xantho scaberrimus WALKER, Jour. Linn. Soc. London, XX, 1887, pp. 109 and 115, pl. VII, figs. 1-4.

Xantho (Lophocaulus) scaberrimus ALCOCK, Jour. Asiatic Soc. Bengal, LXVII, 1898, p. 116.

Wakanoura, Kii; 1 female.

LEPTODIUS EXARATUS (Milne Edwards).

Chlorodius exaratus MILNE EDWARDS, Hist. Nat. Crust., I, 1834, p. 402.

Leptodius exaratus A. MILNE EDWARDS, Nouv. Arch. Mus. Hist. Nat. Paris, IV, 1868, p. 71.

Xantho (Leptodius) exaratus ALCOCK, Jour. Asiatic Soc. Bengal, LXVII, 1898, p. 118, and synonymy.

Misaki, Sagami.

Family PORTUNIDÆ.

OVALIPES BIPUSTULATUS (Milne Edwards).

Platyonichus bipustulatus MILNE EDWARDS, Hist. Nat. Crust., I, 1834, p. 437, pl. XVII, figs. 7-10.

Corystes (Anisopus) punctata DE HAAN, Fauna Japon., Crust., 1835, p. 44, pl. II, fig. 1.

Ovalipes bipustulatus RATHBUN, Proc. U. S. Nat. Mus., XXI, 1898, p. 597.

Same, Rikuoku.

LIOCARCINUS STRIGILIS (Stimpson).

Portunus (Portunus) corrugatus DE HAAN, Fauna Japon., Crust., 1835, p. 40 (not *P. corrugatus* Leach).

Portunus strigilis STIMPSON, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 38 [35].

Misaki, Sagami; Wakanoura, Kii; Nagasaki, Hizen.

As compared to *L. corrugatus* (Leach), *L. strigilis* is longer and narrower—length 0.85 to 0.87 of width; in *L. corrugatus*, length 0.79 to 0.8 of width. The antero-lateral margin is relatively longer than the postero-lateral. The median tooth of the front is more triangular, its sides at right angles to each other, tip acute; in *L. corrugatus* the sides form an obtuse angle, which is bluntly rounded.

Dimensions.—Male, length 22.6 mm., width 26.6 mm.; female, length 26.2 mm., width 30 mm. Stimpson's type was very small, said to be 0.28 of an inch long, 0.3 of an inch wide. This is probably

an error, as in his figure (unpublished) the carapace measures 13.5 mm. long by 15.5 mm. broad; the figure is enlarged twice, making the actual measurements 6.75 mm. by 7.75 mm., or 0.26 by 0.3 inch.

PORTUNUS PELAGICUS (Linnæus).

Cancer pelagicus LINNÆUS, Syst. Nat., 10th ed., I, 1758, p. 626.

Portunus pelagicus FABRICIUS, Suppl. Ent. Syst., 1798, p. 367.

Neptunus pelagicus ALCOCK, Jour. Asiatic Soc. Bengal, LXVII, 1898, p. 34, part; not all references to synonymy.

Kawatana; 1 male, 1 female.

PORTUNUS TRITUBERCULATUS (Miers).

Portunus (Neptunus) pelagicus DE HAAN, Fauna Japon., Crust., 1835, p. 37, pls. ix and x.

Neptunus trituberculatus MIERS, Ann. Mag. Nat. Hist. (4), XVII, 1876, p. 221, and (5), V, 1880, p. 238.

Neptunus (Neptunus) pelagicus var. *trituberculatus* ORTMANN, Zool. Jahrb., Syst. VII, 1893, p. 74.

Wakanoura, Kii, 1 female; Yokohama, 1 male, 1 female, and Hakodate, 1 female, U. S. Fish Commission steamer *Albatross*; Japan, 3 males, 2 females.

This form seems to me specifically distinct from *P. pelagicus*, of which 32 specimens have been examined. In *P. trituberculatus*, the granules of the carapace are much finer and more numerous. There is a very prominent lump on the postgastric and two on the cardiac region. The front has only two teeth between the inner orbital teeth, the two small teeth at the base of the epistomial spine being absent. The middle lobe of the supraorbital border is rounded, not dentiform nor spiniform. The anterior margin of the arm carries 4 (in one case 3) spines. The length of the sixth abdominal somite in the male is greater than its proximal width; in *P. pelagicus* less, or just equal to that width. The sternum of the female is coarsely granulate; carinae of second and third abdominal segments laterally strongly produced in an acute tooth or spine.

PORTUNUS GLADIATOR Fabricius.

Portunus gladiator FABRICIUS, Suppl. Ent. Syst., 1798, p. 368.

Neptunus (Amphitrite) gladiator ALCOCK, Jour. Asiatic Soc. Bengal, LXVIII, 1899, p. 35, and synonymy.

Wakanoura, Kii; 1 male, 1 female.

Amphitrite media Stimpson, as figured by him in his unpublished report on the Crustacea of the North Pacific Exploring Expedition, differs from *P. gladiator* in the nearly equal and equally advanced teeth of the front, the appressed and overlapping antero-lateral teeth, the shorter lateral spine.

PORTUNUS HASTATOIDES Fabricius.

Portunus hastatoides FABRICIUS, Suppl. Entom. Syst., 1798, p. 368.

Nepturus (Hellenus) hastatoides ALCOCK, Jour. Asiatic Soc. Bengal, LXVIII, 1899, p. 38, and synonymy.

Wakanoura, Kii, 1 young male, 1 female; Nagasaki, Hizen, 4 males, 5 females.

CHARYBDIS JAPONICA (A. Milne Edwards).

Portunus (Charybdis) G—dentatus DE HAAN, Fauna Japon., Crust., 1835, p. 41, pl. XII, fig. 1. Not *Cancer scindentatus* Herbst.

Goniosoma japonicum A. MILNE EDWARDS, Arch. Mus. Hist. Nat. Paris, X, 1861, p. 373.

Matsushima, Rikuzen; Tokyo; Wakanoura, Kii; Onomichi, Bingo; Nagasaki, Hizen.

CHARYBDIS MILES de Haan.

Portunus (Charybdis) miles DE HAAN, Fauna Japon., Crust., 1835, p. 41, pl. XI, fig. 1.

Charybdis (Goniosoma) miles ALCOCK, Jour. Asiatic Soc. Bengal, LXVIII, 1899, p. 62, and synonymy.

Wakanoura, Kii.

CHARYBDIS VARIEGATA (Fabricius).

Portunus variegatus FABRICIUS, Suppl. Ent. Syst., 1798, p. 364.

Charybdis (Goniosoma) variegata ALCOCK, Jour. Asiatic Soc. Bengal, LXVIII, 1899, p. 60, and synonymy.

Wakanoura, Kii, 1 male, 1 female; Nagasaki, Hizen, 2 males, 1 female.

The specimens have been compared with a photograph of Fabricius's types in the museum at Copenhagen.

CHARYBDIS TRUNCATA (Fabricius).

Portunus truncatus FABRICIUS, Suppl. Ent. Syst., 1798, p. 365.

Portunus (Thalamita) truncatus DE HAAN, Fauna Japon., Crust., 1835, p. 43, pl. II, fig. 3, and pl. XII, fig. 3, male only.

Goniosoma ornatum A. MILNE EDWARDS, Arch. Mus. Hist. Nat. Paris, X, 1861, pp. 376 and 385. Not *G. truncatum* A. Milne Edwards, Arch. Mus. Hist. Nat. Paris, X, 1861, pp. 380 and 385, pl. XXXIV, fig. 4.

Charybdis (Goniohellenus) ornata ALCOCK, Jour. Asiatic Soc. Bengal, LXVIII, 1899, p. 64, and synonymy.

Charybdis (Gonioepturus) truncata BORRADAILE, Fauna and Geog. Maldive and Laccadive Arch., I, 1902, p. 200.

Wakanoura, Kii; Nagasaki, Hizen.

The specimens were compared with a photograph of the Fabrician type.

CHARYBDIS SUBORNATA (Ortmann).

Portunus (Thalamita) truncatus DE HAAN, Fauna Japon., Crust., 1835, p. 43, pl. XII, fig. 3, female only; 1849, p. 244.

Portunus (Charybdis) truncatus, varietas, DE HAAN, Fauna Japon., Crust., 1838, p. 65, pl. XVIII, fig. 2.

Gonioneptunus subornatus ORTMANN, Zool. Jahrb., Syst., VII, 1893, p. 79, pl. III, fig. 9.

Charybdis (Gonioneptunus) truncata ALCOCK, Jour. Asiatic Soc. Bengal, LXVIII, 1899, p. 67. Not *Goniosoma truncatum* A. Milne Edwards, Arch. Mus. Hist. Nat. Paris, X, 1861, pp. 380 and 385, pl. XXXIV, fig. 4.

Wakanoura, Kii; Onomichi, Bingo.

THALAMITA SIMA Milne Edwards.

Thalamita sima MILNE EDWARDS, Hist. Nat. Crust., I, 1834, p. 460.—ALCOCK, Jour. Asiatic Soc. Bengal, LXVIII, 1899, p. 81, and synonymy.

Portunus (Thalamita) arcuatus DE HAAN, Fauna Japon., Crust., 1835, p. 43, pl. II, fig. 2; pl. XIII, fig. 1.

Misaki, Sagami; Nagasaki, Hizen.

Family CANCRIDÆ.

TELMESSUS ACUTIDENS (Stimpson).

Cheiragonus acutidens STIMPSON, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 40 [37].

Telmessus acutidens BENEDICT, Proc. U. S. Nat. Mus., XV, 1892, p. 228, pl. XXVI, fig. 1, and synonymy.

Mororan, Hokkaido; Hakodate, Hokkaido (many young); Aomori, Rikuoku.

Family MAIIDÆ.

HUENIA PROTEUS de Haan.

Maja (Huenia) elongata DE HAAN, Fauna Japon., Crust., pl. XXIII, figs. 4, 5.^a

Maja (Huenia) heraldica DE HAAN, Fauna Japon., Crust., pl. XXIII, fig. 6.^a

Maja (Huenia) proteus DE HAAN, Fauna Japon., Crust., 1839, p. 95.

Huenia proteus ALCOCK, Jour. Asiatic Soc. Bengal, LXIV, 1895, p. 195, and synonymy.

Nagasaki, Hizen.

PUGETTIA QUADRIDENS (de Haan).

Pisa (Halimus) quadridens DE HAAN, Fauna Japon., Crust., pl. XXIV, fig. 2, 1838.^b

Pisa (Halimus) incisa DE HAAN, Fauna Japon., Crust., pl. XXIV, fig. 3, 1838.

Pisa (Menoethius) incisa DE HAAN, Fauna Japon., Crust., pl. G.

Pisa (Menoethius) quadridens DE HAAN, Fauna Japon., Crust., pl. G.

Pisa (Menoethius) quadridens DE HAAN, Fauna Japon., Crust., 1839, p. 97.

Pisa (Menoethius) incisus DE HAAN, Fauna Japon., Crust., 1839, p. 98.

Pugettia quadridens RATHBUN, Proc. U. S. Nat. Mus., XVII, 1894, p. 71, and synonymy.

Hakodate, Hokkaido, and Misaki, Sagami; specimens of typical form.

^a Specific name corrected in text.

^b Pp. 65-72 and pls. XXIV, E and F, Fauna Japon., Crust., appeared in 1838, according to Bull. Sci. Phys. Nat. Neerlande, Aug. 31, 1838.

DOCLEA CANALIFERA Stimpson.

- Doclea canalifera* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, 1857, p. 217 [23].—
ALCOCK, Jour. Asiatic Soc. Bengal, LXIV, 1895, p. 228.
Doclea japonica ORTMANN, Zool. Jahrb., Syst., VII, 1893, p. 46, pl. III, fig. 4.—
ALCOCK, Jour. Asiatic Soc. Bengal, LXIV, 1895, p. 227.

Wakanoura, Kii; 3 males, 3 females.

The two largest males agree with descriptions of *D. japonica*; in the four smaller specimens, however, the spines are all better developed, the posterior of the branchial spines being the largest one on the lateral margin. Stimpson's description was based on a young male, of which a figure was made, but is yet unpublished.

HALIMUS DIACANTHUS (de Haan). "

- Pisa (Narcia) diacantha* DE HAAN, Fauna Japon., Crust., 1838, pl. xxiv, fig. 1; 1839, p. 96, and pl. G.
Hystenus diacanthus ALCOCK, Jour. Asiatic Soc. Bengal, LXIV, 1895, p. 210, and synonymy.

Wakanoura, Kii; Nagasaki, Hizen.

MICIPPA PHILYRA (Herbst).

- Cancer philypa* HERBST, Natur. Krabben u. Krebse, III, Pt. 3, 1803, p. 51, pl. LVIII, fig. 4.
Micippa philypa ALCOCK, Jour. Asiatic Soc. Bengal, LXIV, 1895, p. 249, and synonymy.

Wakanoura, Kii.

MICIPPA THALIA (Herbst).

- Cancer thalia* HERBST, Natur. Krabben u. Krebse, III, Pt. 3, 1803, p. 50, pl. LVIII, fig. 3.
Micippa thalia ALCOCK, Jour. Asiatic Soc. Bengal, LXIV, 1895, p. 251, and synonymy.

Nagasaki, Hizen.

Family **PARTHENOPIDÆ**.**LAMBRUS VALIDUS** de Haan.

- Parthenope (Lambrus) valida* DE HAAN, Fauna Japon., Crust., 1839, p. 90, pl. XXI, fig. 1, and pl. XXII, fig. 1.
Lambrus validus ORTMANN, Zool. Jahrb., Syst., VII, 1893, p. 414, and synonymy.

Wakanoura, Kii.

LAMBRUS LACINIATUS de Haan.

- Parthenope (Lambrus) laciniata* DE HAAN, Fauna Japon., Crust., 1839, p. 91, pl. XXII, figs. 2 and 3 (*valida* on plate).
Lambrus laciniatus ORTMANN, Zool. Jahrb., Syst., VII, 1893, p. 415, and synonymy.

Wakanoura, Kii; Onomichi, Bingo; Nagasaki, Hizen.

"I have shown elsewhere (Proc. Biol. Soc. Wash., XI, 1897, p. 157) that *Hystenus* is a synonym of *Halimus*.

Family CALAPPIDÆ.

CALAPPA PHILARGIUS (Linnæus).

Calappa philargius ALCOCK, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 145, and synonymy.

Nagasaki, Hizen; 1 female.

Family MATUTIDÆ.

MATUTA LUNARIS (Forskål).

Cancer lunaris FORSKÅL, Descriptiones Animalium, 1775, p. 91. Not *C. lunaris* Rumph, 1705.

Cancer victor FABRICIUS, Ent. Syst., II, 1793, p. 449.

Matuta victor FABRICIUS, Suppl. Ent. Syst., 1798, p. 369.—ALCOCK, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 160, and synonymy.

Nagasaki, Hizen; 1 female.

Matuta lunaris Alcock^a should be known as *M. planipes* Fabricius. The original of Herbst's pl. VI, fig. 44, is probably not extant; it was not to be found during my visit to the Berlin Museum in 1896.

Family LEUCOSIIDÆ.

PERSEPHONA FUGAX (Fabricius).

Myra fugax ALCOCK, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 202, and synonymy.

Wakanoura, Kii (numerous); Nagasaki, Hizen.

I think that the genus *Myra* Leach is not distinct from *Persephona* Leach.

LEUCOSIDES LONGIFRONS (de Haan).

Leucosia longifrons ALCOCK, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 220, and synonymy.

Wakanoura, Kii; 1 male.

Leucosides Rathbun, 1897,^b was substituted for *Leucosia* Leach, not *Leucosia* Fabricius, restricted by Latreille.

ARCANIA SEPTEMSPINOSA (Fabricius).

Arcania septemspinosa ALCOCK, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 265, and synonymy.

Wakanoura, Kii.

ARCANIA UNDECIMSPINOSA de Haan.

Arcania undecimspinosa ALCOCK, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 266, and synonymy.

Wakanoura, Kii; Nagasaki, Hizen.

^a Jour. Asiatic Soc. Bengal, LXV, 1896, p. 161.

^b Proc. Biol. Soc. Wash., XI, p. 160.

Family DORIPPIDÆ.

DORIPPE DORSIPES (Linnæus).

Dorippe dorsipes ALCOCK, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 277, and synonymy.

Wakanoura, Kii; Nagasaki, Hizen.

DORIPPE JAPONICA de Siebold.

Dorippe japonica DE SIEBOLD, Spicilegia Faunæ Japonicæ, 1824, p. 14.—FÉRUSSAC, Bull. des Sci., IV, 1825, p. 87.—DE HAAN, Fauna Japon., Crust., 1849, p. 122.

Dorippe callida DE HAAN, Fauna Japon., Crust., pl. XXXI, fig. 1.^a Not Fabricius.

Wakanoura, Kii; 2 females.

DORIPPE GRANULATA de Haan.

Dorippe sima DE HAAN, Fauna Japon., Crust., pl. XXXI, fig. 2.^a Not Milne Edwards.

Dorippe granulata DE HAAN, Fauna Japon., Crust., 1839, p. 122. Not *D. granulata* Alcock, Jour. Asiatic Soc. Bengal, LXV, 1896, p. 279.

Minyako, Rikuzen; Wakanoura, Kii; Nagasaki, Hizen.

D. granulata is very different from *D. fucchino* (Herbst). The surface of the carapace is covered with granules, especially dense on the branchial regions, smallest on the protogastric and frontal regions, absent from the sulci and from the margin of the gastric region. The width between the tips of the exorbital teeth is only half or less than half the greatest width of the carapace. The spine at the lower inner angle of the orbit is very short, not nearly as advanced as the front. The roof of the endostomial canal projects as a slight rim beyond the front. The outer surface of the chelipeds is granulate except on the fingers, and, in the female and the smaller cheliped of the male, on the lower central and distal portion of the palm. The margins and carinae of the second and third pairs of legs, save on the dactyli, are granulate, the granules very fine on the propodi.

Dimensions.—Male, length 28.3 mm., width 32.5 mm., exorbital width 14.6 mm., length of second ambulatory leg 76 mm. Female, length 24.6 mm., width 27.6 mm., exorbital width 13.4 mm., length of second ambulatory leg 65 mm.

Suborder ANOMURA.

Family RANINIDÆ.

RANINA RANINA (Linnæus).

Cancer raninus LINNÆUS, Syst. Nat., 10th ed., I, 1758, p. 625.

Ranina scabra, serrata, and dentata of authors.

Misaki, Sagami, 1 male, 1 female; Nagasaki, Hizen, 1 male.

^a Specific name corrected in text.

Family DROMIIDÆ.

DROMIA DORMIA (Linnæus).

Cancer Dormia LINNÆUS, *Amoen. Acad.*, VI, 1763, p. 413; *Syst. Nat.*, 12th ed., I, Pt. 2, 1767, p. 1043.

Dromia Rumphii ALCOCK, *Jour. Asiatic Soc. Bengal*, LXVIII, 1899, p. 137, and synonymy.

Wakanoura, Kii; 1 male.

Family LATREILLIIDÆ.

LATREILLIA VALIDA de Haan.

Latreillia valida DE HAAN, *Fauna Japon.*, *Crust.*, 1839, p. 107, pl. xxx, fig. 1.—
HENDERSON, *Challenger Rept.*, XXVII, 1888, p. 24.

Wakanoura, Kii; 1 female with ova, lacking the chelipeds. The frontal spines have a subterminal spinule.

Family LITHODIDÆ.

CRYPTOLITHODES EXPANSUS Miers.

Cryptolithodes expansus MIERS, *Proc Zool. Soc. London*, 1879, pp. 21 and 47.

Minyako, Rikuzen, 1 male.

Length 51.6 mm., length of rostrum 9.5 mm., width 78.9 mm.; length measured from outer angle of orbit backward 45 mm.

Carapace transversely oblong, without lateral angles, covered with minute vesicular setæ springing from minute punctæ, and also with

larger punctæ. There is a prominent protuberance on the cardiac region, and one on either side of it on the branchial region, the three forming a transverse series and springing from a common base. A similar prominence occupies the gastric region, and through it a median ridge runs on to the distal half of the rostrum. The anterior half of each lateral expansion is occupied

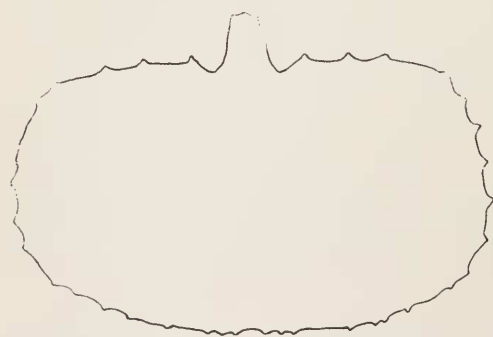


FIG. 1.—CRYPTOLITHODES EXPANSUS, OUTLINE OF CARAPACE, $\times \frac{1}{2}$.

by a low prominence which is tuberculated. The right expansion is a little larger than the left. The margin of the carapace is furnished with small blunt teeth or tubercles at irregular and remote intervals; these number about 34, the largest ones being at the outer angle of the orbit. The rostrum is moderately deflexed, projects well beyond the anterior margin of the carapace, is nearly as long as its width at base,

sides gradually converging and slightly convex, extremity truncate, save for a small median tubercle.

The eyes reach half the length of the rostrum. The second segment of the outer antennae has a bispinose outer crest, one spine pointing forward, the other backward. The acicle is much broader than its axial length; its distal margin (which is directed obliquely) is concave.

In the left cheliped (the right is missing), the basis and ischium are tuberculous below; merus tricarinate, the inner carina cut into 4 irregular teeth, and continuing a similar carina on the ischium; the upper surface of the carpus is rough, the inner margin and angle laminar, the outer carina blunt, a blunt tooth at lower distal angle. Palm and fingers tuberculous inside and out, a sharp carina on upper surface of palm, ending distally in an acute conical tooth, a blunt carina on lower margin of propodus. Fingers considerably longer than upper margin of palm, almost meeting when closed, dactylus carinated above, carina ending proximally in a lobe. The ischium of the ambulatory legs is provided with a tooth on the posterior distal angle of the upper margin, this tooth increasing in size from the first to the third pair. Margins of succeeding joints broadly laminate: the meri with 1 superior and 2 inferior laminae, carpi with 1 superior, propodi and dactyli with 1 superior and 1 inferior. The legs in a natural position are concealed, but when extended, the last and half of the penult segment reach beyond the carapace.

The length of the abdomen exceeds by a small particle its width at base. The first segment is very short, almost linear: its width is less than half the width of the second. The second has a median suture and each half is ventrally concave. The sutures between the lateral plates alternate with those between the segments. The third to sixth segments, inclusive, taken together are concave; the third is narrow and transversely sulcate.

Family PAGURIDÆ.

DARDANUS Paulson.

Pagurus FABRICIUS, Syst. Entom., 1775, p. 410 (part).—STIMPSON, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 233 [71].

Dardanus PAULSON, Crust. Red Sea, 1875, p. 90.

Pagurias BENEDICT, Bull. U. S. Fish Comm. for 1900, II, 1901, p. 141.

Dardanus, a genus made by Paulson for *Pagurus depressus* Heller, is shown by Kossmann^a not to differ from *Pagurus* (so called). The name *Dardanus* is therefore available in place of *Pagurias* Benedict, the name *Pagurus* having been transferred to the group called *Eupagurus* by Brandt.

^a Zool. Ergeb. Reise Rothen Meeres, 1877, p. 76.

DARDANUS PUNCTULATUS (Olivier).

Pagurus punctulatus OLIVIER, Encyc. Méth., Hist. Nat., Insectes, VIII, 1811, p. 641.—ORTMANN, Zool. Jahrb., Syst., VI, 1892, p. 286, and synonymy.

Wakanoura, Kii; two specimens. one in shell of *Pyrgula reticulata* Lamarek.^a

DARDANUS SCULPTIPES (Stimpson).

Pagurus setifer DE HAAN, Fauna Japon., Crust., 1849, p. 209 (not Milne Edwards).

Pagurus sculptipes STIMPSON, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 246 [84].—ORTMANN, Zool. Jahrb., Syst., VI, 1892, p. 287, and synonymy; X, 1897, p. 275.

Wakanoura, Kii; 12 specimens in shells of *Dolium variegatum* Lamarek, *Ranella albivaricosa* Roe, *Fusus inconstans* Lischke, *Septa nodifera* Lamarek, and *Hemifusus tornatinus* Gmelin.

DARDANUS IMPRESSUS (de Haan).

Pagurus impressus DE HAAN, Fauna Japon., Crust., 1849, p. 207, pl. XLIX, fig. 3.

Wakanoura, Kii; 1 male in shell of *Dolium fimbriatum* Sowerby.

DARDANUS HAANII, new name.

Pagurus asper DE HAAN, Fauna Japon., Crust., 1849, p. 208, pl. XLIX, fig. 4.—STIMPSON, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 246 [84]. Not *P. asper* Milne Edwards, 1848.

Misaki, Sagami; 1 male, larger than the one figured by de Haan, in shell of *Turbo japonicus* Roe. The thorax measures 28 mm. long, the larger hand 21.6 mm. long on its lower margin.

The peduncle of the outer antenna is a little longer than the eye. The lower margin of the ischium of the left cheliped has a row of 3 molariform tubercles. Lower inner margin of ischium and merus armed with stout irregular spines, one at the proximal end of merus much the strongest. Outer margin of merus denticulate; from this margin a short row of tubercles extends along lower surface; upper margin squamose, a terminal spine. Carpus spinose; 4 spines on inner margin, 4 smaller on anterior margin; 2 oblique intermediate rows, one of 5 spines terminating at inner distal angle, the other of 3 spines; lower distal margin in part cristiform and denticulate.

The depth of the palm is greater than its width; lower margin marked by a sinuous line of strong molariform tubercles; lower half of outer surface nearly smooth, densely punctate, and with fine granules near the margins; upper half of surface armed with tubercles arranged for the most part in 4 or 5 longitudinal rows, with some granules interspersed; near the upper margin they become stronger,

^aThe shells mentioned in this paper were named by Mr. C. T. Simpson.

and somewhat spiniform; the innermost row of 4 spines runs along the proximal three-fifths of the palm; the next row, of 4 spines also, occupies only the distal half. The pollex has a row of pearly granules near the upper margin; the opposing margins of the fingers are dentate, fitting neatly together, the proximal teeth very fine; the dactylus carries 3 rows of tubercles on its outer surface.

PAGURUS MIDDENDORFFII Brandt.

Pagurus (Eupagurus) middendorffii BRANDT, in Middendorff's Sibir. Reise, II, Pt. 1, 1851, p. 108, pl. v, figs. 1-16.

Eupagurus middendorffii STIMPSON, Proc. Acad. Nat. Sci. Phila., X, 1858, p. 250 [88].

Eupagurus middendorffii ORTMANN, Zool. Jahrb., Syst., VI, 1892, p. 301.

Mororan, Hokkaido, 2 small; Hakodate, Hokkaido, 6 small, in shells of *Litorina* (? *sitchana* Philippi) and *Chlorostoma*.

PAGURUS, sp.

Misaki, Sagami, in shells of *Natica adamsiana* Dunker and *Lampania* sp.; 2 young specimens of a species allied to *P. setosus* (Benedict), *P. kennerlyi* (Stimpson), and *P. constans* (Stimpson). The carpus and palm of the right cheliped have longitudinal rows of spinules, those of the carpus larger than those of the hand, those of the margins scarcely larger than those on the dorsal face.

CLIBANARIUS JAPONICUS, new species.

Mororan, Hokkaido; 1 female (Cat. No. 26151).

Anterior and lateral portions of carapace rugose; there are about 19 tufts of hair, of which 13 tufts are arranged in a pear-shaped figure. Median tooth of anterior margin more advanced than lateral tooth, and armed with a small spine, which is almost concealed beneath a tuft of hair; just below margin of lateral tooth there is also a small spine pointing outward.

The inner portion of the eye-scales is suboval and entire; at the extremity below the margin is a small spine. Eyes slender, shorter than the front is wide. Antennular peduncle longer than eye; third segment a little longer than second, reaching to end of penult segment of outer maxillipeds. Antennal peduncle not quite so long as eye; acicle slender, sickle-shaped, reaching to middle of last segment.

The chelipeds are more unequal than is usual in the genus. The left is the larger; the merus extends beyond the line of the eyes; its lower surface is bordered by spines within and without; superior

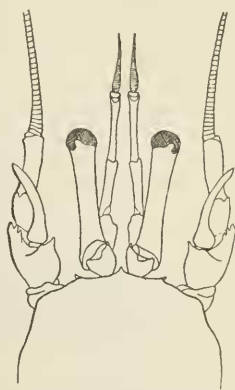


FIG. 2.—CLIBANARIUS JAPONICUS, ANTERIOR PORTION, x. 2.

margin with 2 distal spines, 2 smaller subterminal spines. The carpus is longer than broad, has 2 dorsal rows of spines; anterior margin spinose; outer face with a short row of spines at the upper distal end. The propodus is spinose above, the spines arranged in about seven uneven rows; the palm widens considerably distally; its inner margin is little more than half as long as the dactylus; the fingers have each about 3 rows of spines above, their margins meet when closed, the tips cross. The spines have corneous tips. The cheliped is also beset with bunches of hair arising near the bases of the spines.



FIG. 3.—CLIBANARIUS JAPONICUS, LEFT CHELIPED, $\times 1\frac{3}{4}$.

The right cheliped reaches just to end of palm of left one; the merus falls short of the end of the eyes. The spines are smaller and are less definitely arranged in rows, the palm widens very little toward its distal end, the dactylus is $1\frac{1}{3}$ times longer than inner margin of palm.



FIG. 4.—CLIBANARIUS JAPONICUS, RIGHT CHELIPED, $\times 1\frac{3}{4}$.

The first ambulatory leg extends beyond left cheliped by half the length of dactylus; both first and second pairs are stout, pilose above, dactylus longer than propodus. The lower margin of the merus and the upper margin of the carpus of the first pair have a row of spines: dactyli of both pairs armed on inner face with several rows of dark spines. These legs are not striated, and in alcohol show

no transverse bands of color.

Dimensions.—Length of body 58 mm.; length of cephalothorax 26.2 mm.; distance from tip of rostrum to cervical suture 16 mm.; width of anterior margin 11.1 mm.; length of eye-peduncles 9 mm.; length of propodus of first ambulatory leg, right side, 11.4 mm.; length of

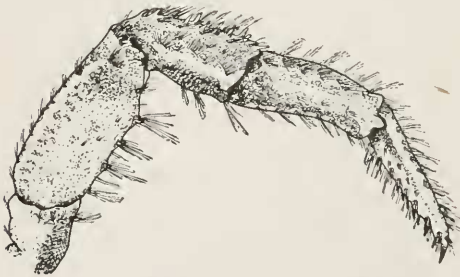


FIG. 5.—CLIBANARIUS JAPONICUS, OUTER FACE OF FIRST AMBULATORY LEG ON RIGHT SIDE, $\times 1\frac{3}{4}$.

dactylus of same 13.4 mm.; length of propodus of second ambulatory leg, right side, 13.4 mm.; length of dactylus of same 15.6 mm.

DIOGENES EDWARDSII (de Haan).

Pagurus edwardsii DE HAAN, Fauna Japon., Crust., 1849, p. 211, pl. 1, fig. 1.

Diogenes edwardsi ORTMANN, Zool. Jahrb., Syst., VI, 1892, p. 295.

Wakanoura, Kii (abundant), in shells of *Cassia japonica* Roe, *Eburna japonica* Sowerby, *Polinices ampla* Philippi, *Ranella albiviridosa* Roe, *Nassa gemmulata* Lamarek, *Siphonalia signum* Roe and *Turbo japonicus* Roe.

Nagasaki, Hizen, in shells of *Siphonalia signum* Roe and *Fusus inconstans* Lischke.

Nearly all of the crabs have an actinian^a attached to the outer surface of the larger palm, while the shells may carry one or more of the same species.

SPIROPAGURUS SPIRIGER (de Haan).

Pagurus spiriger DE HAAN, Fauna Japon., Crust., 1849, p. 206, pl. XLIX, fig. 2.

Spiropagurus spiriger Ortmann, Zool. Jahrb., Syst., VI, 1892, p. 297.

Wakanoura, Kii (abundant), in shells of *Pyrgula reticulata* Lamarck, *Cassia japonica* Roe, *Dolium variegatum* Lamarck?, young, *D. fimbriatum* Sowerby, *Eburnea japonica* Sowerby, *Polinices ampla* Philippi, *Ranella albiviridosa* Roe, *Nassa gemmulata* Lamarck, and *Siphonalia signum* Roe. Nagasaki, Hizen.

Suborder MACRURA.

Family PALINURIDÆ.

PANULIRUS JAPONICUS (de Siebold).

Palinurus japonicus DE SIEBOLD, Spicilegia Faune Japonicæ, 1824, p. 15.—

FÉRUSSAC, Bull. des Sci., IV, 1825, p. 87.—DE HAAN, Fauna Japon., Crust., 1841, p. 158, pls. XLI and XLII.

Nagasaki, Hizen; 3 specimens of medium size.

Family PENÆIDÆ.

PENÆUS CANALICULATUS (Olivier).

Palaemon canaliculatus OLIVIER, Ency. Méth., Hist. Nat., Entom., VIII, 1811, p. 660.

Penæus canaliculatus MILNE EDWARDS, Hist. Nat. Crust., II, 1837, p. 414.

Penæus canaliculatus KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 11, pls. I and VII, figs. 1, 1a, 1b, 1c.

Penæus canaliculatus var. *japonicus* BATE, Challenger Rept., XXIV, 1888, p. 245, pl. XXXI; pl. XXXII, fig. 4; pl. XXXVII, fig. 2.

Tokyo; Hiroshima, Aki.

PENÆUS LATISULCATUS Kishinouye.

Penæus latisulcatus KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 12, pl. II, fig. 2; pl. VII, figs. 2, 2a.

Nagasaki, Hizen; 1 male, 1 female. Also taken at Mogi by Dr. F. C. Dale, U. S. S. *Palos*, June 18, 1881, 1 male, 2 females; and at Tokyo by the U. S. Fish Commission steamer *Albatross*, October, 1896, 1 male, 1 female, the latter measuring 18.5 em. long.

^a A description of this actinian, by Dr. J. Playfair McMurrich, will be found later in this volume.

PENÆUS ASHIAKA Kishinouye.

Penæus semisulcatus STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 44 [113]. Not *P. semisulcatus* de Haan.

Penæus ashiaka KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 14, pl. III; pl. VII, figs. 4, 4a, 4b (not 3, 3a, 3b).

Tokyo; Wakanoura, Kii; Nagasaki, Hizen. Females only.

This species is very near *P. semisulcatus* de Haan (not = *P. monodon* Fabricius, Kishinouye), but the posterior gastric tooth is further back; the lateral grooves reach distinctly behind that tooth, while in *P. semisulcatus* the grooves fade out near the last tooth; the thelycum is slightly different; the telson is longer than the sixth segment, in *P. semisulcatus* shorter.

PARAPENÆUS AFFINIS (Milne Edwards).

Penæus affinis MILNE EDWARDS, Hist. Nat. Crust., II, 1837, p. 416.

Parapenæus affinis SMITH, Proc. U. S. Nat. Mus., VIII, 1885, p. 176.

Penæus affinis KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 16, pl. IV, fig. 1; pl. VII, figs. 5, 5a, 5b, 5c.

Onomichi, Bingo: 1 male, 1 female.

PARAPENÆUS INCISIPES (Bate).

Penæus incisipes BATE, Challenger Rept., XXIV, 1888, p. 257, pl. XXXIV, fig. 2.

Penæus incisipes KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 18, pl. IV, fig. 2; pl. VII, figs. 6, 6a, 6b.

Wakanoura, Kii; Hiroshima, Aki; Nagasaki, Hizen.

PARAPENÆUS JOYNERI (Miers).

Penæus joyneri MIERS, Ann. Mag. Nat. Hist. (5), V, 1880, p. 458, pl. xv, figs. 8-10.

Penæus joyneri KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 19, pl. v, pl. VII, figs. 7, 7a, 7b, 7c.

Tokyo; 2 males.

PARAPENÆUS CURVIROSTRIS (Stimpson).

Penæus curvirostris STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 44 [113].

Penæus curvirostris KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 23, pl. VI, fig. 4; pl. VII, figs. 10, 10a, 10b, 10c.

Hakodate, Hokkaido; Aomori, Rikuoku; Nagasaki, Hizen.

PARAPENÆUS LAMELLATUS (de Haan).

Penæus lamellatus DE HAAN, Fauna Japon., Crust., 1849, p. 193, pl. XLVI, figs. 4, 5.—
KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 25, pl. VI, fig. 1; pl. VII, fig. 12.

Nagasaki, Hizen; 1 female.

PARAPENÆUS AKAYEBI, new species.

Penæus velutinus BATE, Challenger Rept., XXIV, 1888, p. 253 (part). Not *P. velutinus* Dana.

Penæus velutinus KISHINOUE, Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 26, pl. VI, fig. 2; pl. VII, figs. 11, 11a, 11b.

I think that this species can not be Dana's *P. velutinus*, as the maxillipeds are much shorter and the lateral spines of the telson are very large. Our species, however, coincides with some of the *Challenger* specimens collected in 8 fathoms in Japanese waters, labeled *P. velutinus* by Bate, and presented to the U. S. National Museum. The Japanese form is not that figured by Bate (pl. xxxiii, fig. 1). His remarks^a indicate that he combined a number of species under the name *velutinus*.

Kishinouye^b mentions, without description, the occurrence in Japan of some species very closely allied to that which he calls *Penæus velutinus*; there is one such species (see below) in the Jordan and Snyder collection, and two others in the U. S. National Museum. The four species agree in their pubescence, in the lack of a carina on the carapace behind the gastric spine, and in the long lateral spines of the telson.

In *Parapenæus akayebi* (= *Penæus velutinus* Kishinouye), the rostrum is horizontal or nearly so, and in adults extends to the end or beyond the end of the second segment of the antennula. Dorsal spines 7 or 8, the posterior spine situated a little in front of the anterior third of the carapace (rostrum excluded). A pair of ventral spines between the bases of the feet of the second pair. The sixth and seventh pleonic segments are elongate; the sixth segment is about three-fourths the length of the carapace.

Dimensions.—Female, length 87.9 mm., length of carapace and rostrum 31.1 mm., length of carapace 17.5 mm., length of sixth pleonic segment, on median line, 14 mm.

Localities.—Wakanoura, Kii (3 males, 1 female); Onomichi, Bingo (1 female); Kawatana (1 female); Nagasaki, Hizen (4 males, 1 female); Jordan and Snyder coll. Japan; R. Hitchcock, coll. (1 male, 6 females; types, Cat. No. 26152), Mogi; Dr. F. C. Dale, U. S. N., U. S. S. *Pulos*, collector.

This species, according to Dr. Kishinouye, is known in Japan as "akayebi."

PARAPENÆUS MOGIENSIS, new species.

The rostrum is straight, inclined slightly upward and does not extend quite to the end of the second antennular segment. Dorsal

^a Challenger Report, XXIV, 1888, p. 256.

^b Jour. Fish. Bureau, Tokyo, VIII, 1900, p. 27.

spines 8 or 9, the posterior one situated at the anterior fourth of the carapace, or further forward than in *P. akayebi*. Ventral spines between the bases of the feet of the second pair rudimentary. The sixth and seventh pleonic segments are shorter than in *P. akayebi*; the sixth segment is about three-fifths as long as the carapace; the seventh a little longer

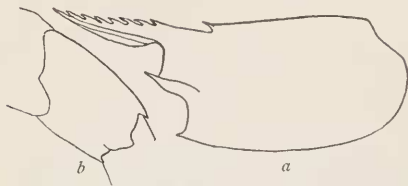


FIG. 6.—*PARAPENEUS MOGIENSIS*, FEMALE, $\cdot 1\frac{1}{2}$;
a, CARAPACE; b, SIXTH SEGMENT OF ABDOMEN.

than the sixth. The thelycum and petasma are distinctive; the right branch of the latter is very broad at the end; the left branch is pointed at the end, and bears a few subterminal denticles.



FIG. 7.—*PARAPENEUS MOGIENSIS*, PETASMA, VENTRAL VIEW, $\cdot 4\frac{1}{2}$.



FIG. 8.—*PARAPENEUS MOGIENSIS*, THELYCUM, $\cdot 4\frac{1}{2}$.

Dimensions.—Female, length 80.7 mm., length of carapace and rostrum 29 mm., length of carapace 18.1 mm., length of sixth pleonic segment, measured on median line, 11.4 mm.

Type locality.—Mogi, Japan (with the preceding); Dr. F. C. Dale, U. S. N., U. S. S. *Palos*, June 18, 1881; 2 males, 5 females. (Cat. No. 26153.)

PARAPENÆUS DALEI, new species.

The rostrum is nearly horizontal, slightly convex or straight, and does not extend beyond the middle of the second antennular segment.



FIG. 10.—*PARAPENEUS DALEI*, PETASMA, VENTRAL VIEW, $\cdot 4\frac{1}{2}$.

The dorsal spines are 7 (exceptionally 8), the posterior one at the anterior fourth of the carapace. A pair of ventral spines between the bases of the feet of the second pair. The sixth pleonic segment is longer than in *P. mogiensis*, but not so long as in *P. akayebi*; it is about two-thirds as long as the carapace. The left branch of the petasma has a much more slender tip than in *P. mogiensis*, and the subterminal denticles are larger.

Dimensions.—Female, length 57 mm., length of carapace and rostrum 19 mm., length of carapace 12.5 mm., length of sixth pleonic segment, measured on median line, 7.9 mm.



FIG. 9.—*PARAPENEUS DALEI*, FEMALE, $\cdot 1\frac{1}{2}$; a, CARAPACE; b, SIXTH SEGMENT OF ABDOMEN.



FIG. 11.—*PARAPENEUS DALEI* THELYCUM, $\times 6\frac{1}{2}$.

Localities.—Six males and six females were taken at Mogi, with the two preceding species, by Dr. F. C. Dale, U. S. N., U. S. S. *Palos*, June 18, 1881; types (Cat. No. 26154). A somewhat larger male, of which the rostrum and the abdomen behind the third segment are lacking, was captured at Hakodate, Hokkaido, by Dr. Jordan and Mr. Snyder.

PARAPENÆUS ACCLIVIS, new species.

Rostrum ascending, reaching the end or a little beyond the end of the second antennular segment. Dorsal spines 8 or 9, the posterior



FIG. 12.—PARAPENÆUS ACCLIVIS, FEMALE. $\times 1\frac{1}{2}$: a, CARAPACE; b, SIXTH SEGMENT OF ABDOMEN.

spine at the anterior fourth of the carapace. A pair of ventral spines between the bases of the feet of the second pair. The sixth pleonic segment is about seven-tenths as long as the carapace, and a little shorter than the seventh. The petasma is most nearly related to that of *P. akayebi*.

Dimensions.—Female, length 85.4 mm., length of carapace and rostrum 30 mm., length of carapace 18 mm., length of sixth pleonic segment, measured on median line, 13 mm.

Type locality.—Mogi,

Japan; Dr. F. C. Dale, U. S. N., U. S. S. *Palos*, June 18, 1881; 3 males, 2 females. (Cat. No. 26155.)

SICYONIA CRISTATA (de Haan).

Hippolyte cristatus DE HAAN, Fauna Japon., Crust., pl. XLV, fig. 10. (Specific name corrected in text.)

Sicyonia cristata DE HAAN, Fauna Japon., Crust., 1849, p. 194.

Nagasaki, Hizen. Mogi (Dr. F. C. Dale).

Dorsal spines 7 or 8 (4 on the carapace proper): apex of rostrum tridentate.

SOLENOCERA DISTINCTA (de Haan).

Penacus distinctus DE HAAN, Fauna Japon., Crust., 1849, p. 194.

Solenocera distincta MIERS, Proc. Zool. Soc. London, 1878, p. 302; 1879, p. 22.—

KOEBEL, SB. Ak. Wien, XC, Pt. 1, 1884, p. 314, pl. II, figs. 1-7.

Wakanoura, Kii; one specimen.



FIG. 13.—PARAPENÆUS ACCLIVIS, THELYCUM, $\times 3\frac{1}{2}$.



FIG. 14.—PARAPENÆUS ACCLIVIS, PETASMA, VENTRAL VIEW, $\times 3\frac{1}{2}$.

Family CRANGONIDÆ.

CRANGON CRANGON (Linnæus).

Cancer crangon LINNÆUS, Syst. Nat., 10th ed., I, 1758, p. 632.

Crangon vulgaris FABRICIUS, Suppl. Entom. Syst., 1798, p. 410.

Crangon crangon ORTMANN, Proc. Acad. Nat. Sci. Phila., 1895, p. 179 (not synonymy).

Same, Rikuoku; Jordan and Snyder; one specimen. Hakodate, Hokkaido; U. S. Fish Commission steamer *Albatross*, several specimens.

I have separated from *C. crangon* of Europe the form occurring in America (Atlantic and Alaskan coasts) under the name *C. septemspinosa* Say, on account of the antennal scale being narrower at the distal end, this margin sloping backward toward the inner end, instead of forward as in *C. crangon*; the spine of the scale is also proportionally longer in *C. septemspinosa*, equaling or exceeding the distal width of the blade, while in *C. crangon* the spine is usually shorter than the distal width of the blade.

Japanese specimens resemble the European rather than the American species. The scale is about two-thirds as long as the carapace (rostrum excluded). The length of the palms of the chelipeds varies from 2.4 to 2.8 times the width.

CRANGON PROPINQUÛS Stimpson.

Crangon propinquus STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 25 [94].

Aomori, Rikuoku; 4 specimens.

Rostrum narrow, exceeding the eyes, slightly spatulate. Scale measured on outer margin about five-sixths as long as carapace, exclusive of rostrum; spine more advanced than the blade. The palms of the chelæ are about $3\frac{1}{2}$ times as long as wide, and the distal margin against which the dactylus folds, is directed obliquely at an angle of about 45 degrees. The third and fourth segments of the pleon are bluntly carinate. The telson is nearly as long as the carapace (rostrum excluded). The sixth segment and the telson are flattened above, and incompletely and indistinctly sulcate.

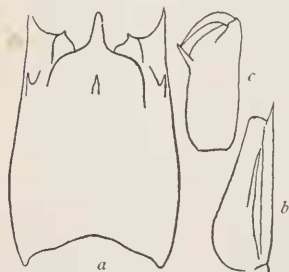


FIG. 15.—CRANGON HAKODATEI;
a, CARAPACE, $\times 2\frac{3}{4}$; b, ACICLE, $\times 3\frac{1}{2}$;
c, CHELIPED, $\times 3\frac{1}{2}$.

CRANGON HAKODATEI, new species.

Dorsal surface pubescent, except on the abdominal carinæ. One median gastric spine. Rostrum not exceeding the eyes, gradually tapering, tip rounding. Scale (measured on outer margin) four-fifths as long as carapace, exclusive of rostrum; spine projecting beyond the blade as far as the

distal width of the blade. The outer maxillipeds reach to the extremity of the acicular spine. Palms of chelipeds $2\frac{1}{2}$ times as long as wide; distal margin, against which the dactylus folds, inclined at about 45 degrees to the side margins. Abdomen furnished on the third, fourth, and fifth segments, with a high, blunt, naked, median carina; sixth and seventh segments with a shallow median sulcus.

Dimensions.—Female, length of body from tip of rostrum to tip of telson 44.5 mm., length of carapace from tip of rostrum 12.2 mm., length of scule (outer margin) 7.5 mm., length of palm of chela 5.5 mm.

Type locality.—Hakodate, Hokkaido; 8 specimens (Cat. No. 26156).

Family ALPHEIDÆ.

ALPHEUS RAPAX Fabricius?, Coutière.

?*Alpheus rapax* FABRICIUS, Suppl. Entom. System., 1798, p. 405.

Alpheus brevicristatus DE HAAN, Fauna Japon., Crust., pl. XLV, fig. 1. (Specific name corrected in text.)

Alpheus malabaricus DE HAAN, Fauna Japon., Crust., 1849, p. 177.

Alpheus rapax COUTIÈRE, Ann. Sci. Nat. (8), Zool., IX, 1899, p. 14.

Tokyo (1); Misaki, Sagami (3); Nagasaki, Hizen (2 specimens).

ALPHEUS BREVIROSTRIS (Olivier).

Palaemon brevirostris OLIVIER, Encyc. Méth., Hist. Nat., Entom., VIII, 1811, p. 664; Tabl. Encyc. Méth., 1818, pl. CCCIX, fig. 4.

Alpheus rapax DE HAAN, Fauna Japon., Crust., 1849, p. 177, pl. XLV, fig. 2. Not *A. rapax* Fabricius.

Alpheus digitalis DE HAAN, Fauna Japon., p. 178, pl. XLV, fig. 4.

Alpheus brevirostris COUTIÈRE, Ann. Sci. Nat. (8), Zool., IX, 1899, p. 14.

Wakanoura, Kii; Onomichi, Bingo; Nagasaki, Hizen. A good series.

Family HIPPOLYTIDÆ.

SPIRONTOCARIS MORORANI, new species.

Very close to *S. dalli* Rathbun. Differs as follows: The dorsal carina is armed with 4 equal larger spines (instead of 3), of which 3 are on the carapace proper and one over the base of the eye; remainder of the rostrum furnished with 10 small spines above and 4 spines below, of which one is near the tip and makes it appear bifid. The rostrum is a little shorter than in *S. dalli*, reaching half way between the end of the antennular peduncle and the end of the antennal scale. Of the two supraorbital spines one is situated well behind the other; the anterior is nearly as strong as the posterior. The basal scale of the antennula reaches just to the end of the second segment. The antennal scale is narrower at the end than in *S. dalli*; the laminar portion is separated by a deep narrow slit from the spine. The outer maxilliped extended



FIG. 16.—SPIRONTOCARIS MORORANI, CARAPACE OF FEMALE. $\times 2\frac{1}{2}$.

reaches just to the end of the acicle: it is furnished with exopod and epipod; also the first three feet with epipods, as in *S. dalli*. Dactyli of last three feet longer than in *S. dalli*, being more than one-fourth the length of their respective propodi. The sixth segment of the abdomen is much shorter than in *S. dalli*, being less than half the length of the carapace (rostrum excluded).

Dimensions.—Female, length 33.5 mm., length of carapace and rostrum 11.8 mm., of rostrum 5.1 mm.

Type locality.—Mororan, Hokkaido; 1 female (Cat. No. 26157).

SPIRONTOCARIS JORDANI, new species.

Near *S. rectirostris* (Stimpson) of which I have at hand one specimen from Fusan, Korea (P. L. Jouy, collector, 1885), and one specimen from Hakodate Bay, Japan, 11½ fathoms (station 3656, U. S. Fish Commission steamer *Albatross*).

In *S. jordani* the rostrum extends barely to the end of the antennal peduncle, nearly straight and horizontal, slightly convex above, narrow, of about even width throughout, armed with 8 spines above, of which 2 are behind the orbit, and 1 beneath, subterminal; the posterior spine is situated at the anterior fifth of the carapace; at its posterior base there is a rudiment of another spine. As in *S. rectirostris* there is no supraorbital, an antennal, a very small pterygostomial spine. The antennular scale reaches to the end of the second antennular segment; the antennular peduncle to the middle of the antennal scale; this scale is very broad at its extremity, the blade exceeds the spine. The outer maxillipeds overreach the scale by half the length of the last segment. They are destitute of an exopod, but are provided with an epipod, as are also the first three pairs of feet. The third pair of feet overreach a little the first pair, their dactyli are one-fourth as long as their propodi. The sixth segment of the abdomen is three-fifths as long as the carapace (rostrum excluded). Telson as long as the inner uropod, much shorter than the outer one.



FIG. 17.—SPIRONTOCARIS JORDANI,
CARAPACE OF FEMALE, $\times 2\frac{1}{2}$.

Dimensions.—Female, length 46.5 mm., length of carapace and rostrum 13.2 mm., of rostrum 5 mm.

Type locality.—Hakodate, Hokkaido; 1 female (Cat. No. 26158).

SPIRONTOCARIS GREBNITZKII, new species.

Near *S. stylus* (Stimpson), but stouter. Rostrum nearly as long as the rest of the carapace, reaching to end of antennal scale, straight, acute. Dorsal carina arising at the middle of the carapace, armed with 8 equal and equidistant spines, 2 of which are behind the orbit, the posterior one at the anterior fifth of the carapace, the anterior spine just before the middle of the rostrum. Lower margin armed

with 2 or 3 spines, the posterior of which is just anterior to the distal of the superior spines. A strong antennal, a minute pterygostomial spine. Eyes very small. Antennular peduncle falling short of the middle of the antennal scale; basal scale of antennula reaching about to middle of second segment. Antennal scale three-fourths as long as carapace; blade much exceeding spine. The maxillipeds reach just to end of scale, are devoid of an exopod, but provided with an epipod, as are the first three pereopods. The sixth segment of the abdomen is a little more than half as long as the carapace. The telson is shorter than the subequal uropods, and is armed with 4 pairs of lateral spinules.

Dimensions.—Female, length 54.5 mm., length of carapace and rostrum 18.5 mm., of rostrum 8.7 mm.

Type locality.—One specimen was secured by Dr. Jordan and Mr. Snyder at Mororan, Hokkaido, but as it is imperfect, I have taken for the type another from the same locality collected a few years ago by N. Grebnitzki (Cat. No. 26159).



FIG. 18.—SPIRONTOCARIS GREBNITZKII, CARAPACE OF FEMALE, $\times 13$.

SPIRONTOCARIS GENICULATA (Stimpson).

Hippolyte geniculata STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 34 [103].

Mororan, Hokkaido; Jordan and Snyder: 6 small.

Miura, Atami District, March, 1890; F. Sakamoto: 2 females with ova. Called "Kushakoshi ebi or grass-belt shrimp."

Rostrum longer than the carapace (measured on median line from posterior margin to line of orbits), not quite reaching tip of antennal scale, straight, horizontal, acuminate, armed with 4 or 5 teeth above, 1 or 2 of which are behind the orbit, and 5 to 8 teeth below, 1 or 2 of which may be subterminal. A strong antennal, no supraorbital nor pterygostomial spine.

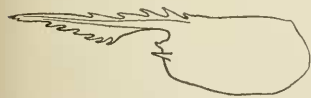


FIG. 19.—SPIRONTOCARIS GENICULATA, CARAPACE OF FEMALE, $\times 1\frac{1}{2}$.

The antennular peduncle reaches about one-third the length of the acicle; its basal scale extends a little beyond first segment. The antennal peduncle reaches to end of second segment of antennular peduncle; the acicle is a little longer than the carapace, extremity very oblique, blade exceeding by far the spine. The outer maxillipeds and the fifth pair of pereopods reach just to the end of the antennular peduncle; the second pair of pereopods to the middle of the acicle. The maxillipeds have an epipod but no exopod; the pereopods are destitute of epipods.

The abdomen is bent at a right angle at the third segment: in profile the angle is rounded; the posterior part of the third segment is strongly compressed. This compression and angulation is very well marked in the adult females from Miura, much less so in the specimens.

two-thirds the size, from Mororan. The sixth segment is three-fifths as long as the carapace, and four-fifths as long as the telson. Telson shorter than uropods, of which the inner is shorter than the outer lateral spines 3 or 4.

Dimensions. Female with ova: Length 60.1 mm., length of carapace and rostrum 21.8 mm., length of rostrum 11.4 mm.

PLATYBEMA PLANIROSTRE (de Haan).

Lysmata planirostris DE HAAN, Fauna Japon., Crust., pl. O.^a

Hippolyte planirostris DE HAAN, Fauna Japon., Crust., pl. XLV. fig. 7.^a

Cyclorhynchus planirostris DE HAAN, Fauna Japon., Crust., 1849, p. 175.

Rhynchocyclops planirostris STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860,

p. 27 [96].—MIERS, Proc. Zool. Soc. London, 1879, p. 55.

Rhynchocyclops mucronatus STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860,

p. 28 [96].

Platybema planirostris BATE, Challenger Macrura, 1888, p. 578.

Hakodate, Hokkaido; 2 females with ova.

In both these specimens the posterior median spine is rudimentary, being present in the shape of a smooth rounded lobe. In the only specimen provided with a rostrum, the teeth above the point number 15, those below 12. Anterior margin of carapace behind the antennae armed with about 9 pectinated spines. Antennal flagellum nearly as long as body. The carpus of the first pair of feet is not carinate above, and is provided with a tooth at the upper distal end. Carpus of second pair triarticulate, first and third articles equal, both together nearly as long as second.

Family PANDALIDÆ.

PANDALUS HYP SINOTUS Brandt.

Pandalus hypsinotus BRANDT, in Middendorff's Reise in den äussersten Norden und Osten Sibiriens, II, Zool., I, 1851, p. 125.

Mororan, Hokkaido; one young specimen about 25 mm. long. This locality is an extension of the range, the species having a distribution from Bering Sea southward, on the one hand to the Straits of Fuca and on the other to the Kurile Islands.

A figure will be given in the forthcoming report on the Decapoda of the Harriman Expedition.

PANDALUS LATIROSTRIS, new species.

Carapace and rostrum as long as the abdomen, lacking one-fourth of the telson. Rostrum one-third longer than the carapace, basal half horizontal, terminal half slightly ascending, broad at base, gradually tapering, a prominent smooth lateral carina. Dorsal carina arising at the middle of the carapace, armed with a series of 16 to 18 movable spines, of which 4 or 5 are behind the orbit, the posterior spine at

about the anterior sixth of the carapace, anterior spine near the middle of the rostrum; in addition, there is one subterminal immovable spine, occasionally two. Extremity of rostrum spiniform. Lower limb rather deep in front of the eye, gradually diminishing anteriorly, armed with 10 to 13 immovable spines. Antennal spine strong; pterygostomial spine much smaller, but well marked. Eyes of moderate size, corneae dilated, reddish brown in alcohol.

Peduncle of antennules reaching about one-third the length of the antennal scale; basal scale half as long as first segment, second segment about one-third longer than third. Outer flagellum reaches to

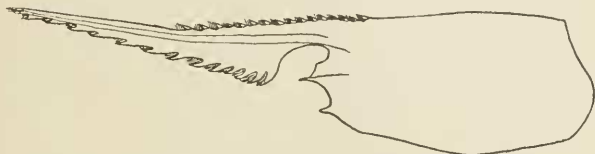


FIG. 20.—*PANDALUS LATIROSTRIS*, CARAPACE, SIDE VIEW, $\times 1\frac{1}{2}$.

the end of antennal scale, slender terminal portion two-fifths as long as thickened basal portion; inner flagellum one-half longer than outer. Peduncle of antennae reaching just to the end of the second segment of the antennular peduncle, the scale reaches not quite to the end of the rostrum, the end of the blade is very obliquely rounded and overreaches considerably the outer spine; the flagellum is as long as the body, exclusive of the telson.

The outer maxillipeds reach only to the middle of the antennal scale, and are rather stout; the first pair of feet reach to the middle of the last joint of the maxillipeds. Of the second pair, the right

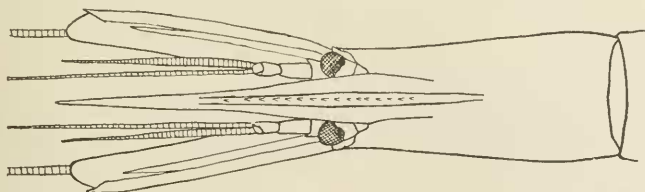


FIG. 21.—*PANDALUS LATIROSTRIS*, CARAPACE AND ANTENNAE, DORSAL VIEW, $\times 1\frac{1}{2}$.

foot is stouter and shorter, reaching as far as the first pair; the left foot exceeds the maxilliped by the length of the chela and half the last carpal joint, and exceeds the third pair but little; the fourth and fifth pairs are successively shorter than the third, and nearer the same length than the third and fourth; the dactyli are contained a little more than three times in their propodi; the latter are not essentially different in the sexes.

The abdomen is smooth; the third segment is very little produced over the fourth. The infero-posterior angle of the fourth, fifth, and sixth segments is armed with a spine. Sixth segment twice as long as wide, and two-thirds as long as the telson, which is armed with 5

or 6 spinules on each side. The telson may be a little longer or shorter than the inner uropods; the outer uropods longer than the inner.

Dimensions.—Female, length 127 mm., length of carapace and rostrum 60.5 mm., length of rostrum 34.5 mm.

Localities.—Mororan, Hokkaido; Jordan and Snyder; 18 specimens, males and females, types (Cat. No. 26160). Two specimens were collected previously at the same place by N. Grebnitzki. Tokyo, 1 young; Jordan and Snyder.

In four instances the acicle on one side is a little longer than that on the other, though both are regular in shape.

PANDALOPSIS MITSUKURII, new species.

Slender. Carapace as long as the abdomen, lacking half the telson. Rostrum one and two-thirds times as long as the rest of the carapace,

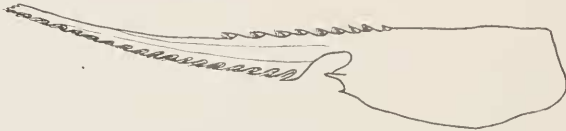


FIG. 22.—PANDALOPSIS MITSUKURII, CARAPACE, SIDE VIEW. $\times 1\frac{1}{2}$.

basal half horizontal, terminal half slightly ascending, slender. Dorsal carina blunt, armed with 8 to 10 movable spines, of which 2 or 3 are behind the orbit, the posterior spine at the anterior fifth of the carapace, and marking the end of the carina; anterior spine but little in front of the posterior third of the rostrum; ventral spines 13 to 18, becoming distally very small and appressed; tip of rostrum trifid. Antennal spine strong, the margin of the carapace retreating rapidly

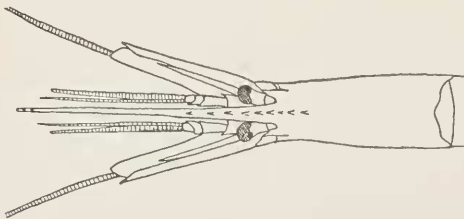


FIG. 23.—PANDALOPSIS MITSUKURII, CARAPACE AND ANTENNAE, DORSAL VIEW. $\times 1\frac{1}{2}$.

from that point; pterygostomian spine two-thirds as large. Eyes small, cornea little dilated, of a dark bluish-gray color in alcohol, a small black ocellus behind the corneal margin and on the upper outer surface.

The peduncle of the antennules reaches about two-fifths the length of the antennal scale; second segment nearly twice as long as third; basal scale small, reaching only to middle of cornea; inner flagellum a little longer than outer and barely attaining the end of the rostrum. Peduncle of antennae reaching to the middle of second antennular segment; the flagellum may equal the length of the body, excluding the telson. The scale extends to about the distal third of the rostrum, oblong, very little tapering, extremity of blade oblique, projecting beyond the spine.

The outer maxillipeds are rather stout, and when extended lie along three-fifths of the antennal scale; the antepenult segment has a narrow laminar expansion below. The first pair of feet attain the end of the penultimate joint of the maxilliped; the merus joint has the expansion characteristic of the genus. The feet of the second pair are equal, carpus 11 or 12 jointed, the proximal and the distal joint elongate, the intermediate joints short and subequal; the chela exceed the maxillipeds by the length of the fingers. The third pair reach scarcely beyond the second pair; the fourth and fifth pairs are much shorter and there is little difference in their length; the fifth pair reaches as far as the first pair; the propodi are three times as long as the dactyli in the third pair, four times as long in the fifth pair, intermediate in the fourth pair.

The abdomen is strongly bent at the third segment, which is laterally compressed, forming a rounded carina. The fourth, fifth, and sixth segments are armed with a postero-inferior spine. Sixth segment three-fifths as long as carapace and four-fifths as long as telson, the latter armed with 4 or 5 spinules on each side. Telson a little shorter than the uropods, of which the inner pair are shorter than the outer.

Dimensions.—Female: Length 105 mm., length of carapace and rostrum 45 mm., length of rostrum 28.1 mm.

Type locality.—Mororan, Hokkaido; Jordan and Snyder; 55 specimens, types (Cat. No. 26164). Two specimens had been taken previously at the same locality by N. Grebnitzki.

The specific name is given in honor of Prof. K. Mitsukuri, of the University of Tokyo.

Family ATYIDÆ.

XIPHOCARIS COMPRESSA (de Haan).

? *Ephyra compressa* DE HAAN, Fauna Japon., Crust., 1849, p. 186, pl. XLVI, fig. 7.

Xiphocaris compressa ORTMANN, Proc. Acad. Nat. Sci. Phila., 1894, p. 400, and synonymy.

Lake Biwa, Matsubara, Omi; many specimens about 1 inch long; Jordan and Snyder.

Tsushima Island, Japan; P. L. Jouy, May, 1885, 1 female with ova.

Near Fusan, Korea, in fresh-water streams; P. L. Jouy, 1 specimen.

CARIDINA DENTICULATA de Haan.

Hippolyte denticulatus DE HAAN, Fauna Japon., Crust., pl. XLV, fig. 8. (Generic name changed in text.)

Caridina denticulata DE HAAN, Fauna Japon., Crust., 1849, p. 186.—ORTMANN, Proc. Acad. Nat. Sci. Phila., 1894, p. 406.

The rostrum extends either to the middle of the third antennular segment, to the end of that segment, or even beyond it. The dorsal

spines are 14 to 18, 3 or 4 behind the orbit, ventral spines 4 to 6, terminal third of rostrum unarmed. The maxillipeds reach nearly to the end of the antennular peduncle; the first pair of feet not quite to the end of antennal peduncle; the carpus is about one and a half times as long as wide, longer than the palm of the hand; the fingers longer than the palm. The second pair of feet reach to the end of the antennal peduncle; carpus and propodus subequal in length, palm enlarged distally, shorter than the fingers. The propodus of the fifth pair of feet is three times as long as the dactylus.

A female with ova measures 22.8 mm. long; the eggs are 0.9 mm. long.

Kurume, Japan; Jordan and Snyder, July 23; 1 female with ova. Near Fusan, Korea, in fresh-water streams; P. L. Jouy; many specimens.

This species is very close to, perhaps identical with, *C. pareparensis* de Man,^a from Celebes, which has a shorter rostrum, with only 2 inferior teeth.

CARIDINA LEUCOSTICTA Stimpson.

Caridina leucosticta STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 28 [97].—

ORTMANN, Proc. Acad. Nat. Sci. Phila., 1894, p. 406.

Atya wyckii HICKSON, Ann. Mag. Nat. Hist. (6), II, 1888, p. 357, pls. XIII and XIV.

Caridina wycki ORTMANN, Proc. Acad. Nat. Sci. Phila., 1894, p. 405, and synonymy.

Kurume, July 23; about 25 specimens.

In most of the specimens the rostrum is broken off near its base; in none is the tip perfect.

Dorsal spines 17 to 23 (2 on carapace); ventral spines 14 in the only specimen where complete (Stimpson says 10). Anterior third or fourth unarmed above, except near the tip, where there is at least one spine. Antennal spine high, quite above the antenna. The color and white spots described by Stimpson are not visible in the preserved specimens.

Family PALEMONIDÆ.

PALÆMON JAPONICUS (Ortmann).

Leander longirostris var. *japonicus* ORTMANN, Zool. Jahrb., Syst., V, 1891, p. 519, pl. xxxvii, figs. 14, 14z.

Matsushima, Rikuzen; Enoshima, Sagami; Kawatana; Nagasaki, Hizen.

The reference of the name *Palæmon longirostris* to Say by Milne Edwards,^b and later by de Man^c and Ortmann,^d is founded on a clerical error. Say^e described only two species of *Palæmon*, both Ameri-

^aWeber's Zool. Ergeb. Reise Niederl. Ost-Indien, II, 1892, p. 379, pl. xxii, fig. 25.

^bHist. Nat. Crust., II, 1837, p. 394.

^cNotes Leyden Mus., III, 1881, p. 141.

^dZool. Jahrb., Syst., V, 1891, p. 519.

^eJour. Acad. Nat. Sci. Phila., I, 1818.

can, viz, *P. vulgaris* on page 248, and *P. tenuicornis* on page 249. Milne Edwards^a refers to both of Say's species, to *P. vulgaris* on page 394, and to "*Palæmon tenuirostre*" on page 395, but his footnote references "(2)" and "(3)" to Say's descriptions, instead of being placed correctly in the text, i. e., (2) after *P. vulgaris* and (3) after *P. tenuirostre*, are made dependent, (2) on *P. longirostris* and (3) on *P. vulgaris*. The name *P. longirostris* Milne Edwards, occurring on p. 394, was changed by him in Errata, vol. III, p. 638, 1840, to *P. styliferus*, a name apparently overlooked by subsequent authors, but which must stand for that species. The name *P. longirostris* should be used for the species so designated by Milne Edwards on p. 392 (= *P. edwardsii* Heller).

Ortmann^b makes *P. japonicus* a variety of *P. styliferus*, but it is distinguished as follows: *P. japonicus* has no dorsal spines on the rostrum except at the base, while *P. styliferus* has 2 or 3 on the terminal half. *P. japonicus* has 4 to 6 ventral spines, *P. styliferus* 8 to 10. In *P. japonicus* the sixth segment of the pleon is nearly two-thirds as long as the carapace (rostrum excluded); in *P. styliferus* it is shorter, barely more than half the carapace. In *P. japonicus* the carpus of the second pair of feet is as long as the merus or the fingers, while in *P. styliferus* the carpus is considerably shorter than merus or fingers.

There are in the U. S. National Museum a number of specimens of *P. styliferus* from Kurrachee, India, collected by Francis Day.

PALÆMON PAUCIDENS de Haan.

Palemon paucidens de HAAN, Fauna Japon., Crust., 1849, p. 170, pl. XLV, fig. 11.

Leander paucidens STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 40 [109].

Aomori, Rikuoku; Matsushima, Rikuzen; Misaki, Sagami; Lake Biwa, Matsubara. Omi (abundant); Kawatana; Kurume; Nagasaki, Hizen.

Korea, P. L. Jouy coll.: Fusan; Gensan, brackish streams flowing into the sea.

The rostrum has 5 to 6 teeth above (1 on carapace), 2 to 3 below, and is usually bifid at extremity; it extends about to the end of the acicle. The branches of the outer flagellum of the antennulæ are joined for about 8 segments or less than half of the length of the shorter branch. In fully developed specimens the outer maxillipeds may or may not exceed the antennal peduncle, and the carpus of the second pair of feet usually exceeds the acicle.

Dimensions.—A large female measures 66.5 mm. long. Several hundred specimens were taken at Lake Biwa, all smaller than those from salt water; a female with ova measures 38 mm. Stimpson^c records its occurrence in fresh water, in rivers near Simoda.

^a Hist. Nat. Crust., II, 1837.

^b Zool. Jahrb., Syst., V, 1891, p. 519.

^c Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 40 [109].

PALÆMON SERRIFER (Stimpson).

Leander serrifer STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 41 [110].—
DE MAN, Notes Leyden Mus., III, 1881, p. 139.—ORTMANN, Zool. Jahrb.,
Syst., V, 1891, p. 525, pl. xxxvii, fig. 17.

Misaki, Sagami; Jordan and Snyder collection. Atami district; F. Sakamoto collector, April, 1894.

Out of 21 specimens with perfect rostrum, 7 have 9 teeth above, the remainder mostly 10 teeth above; 15 have 3 teeth below, the remainder varying from 2 to 5 teeth.

PALÆMON MACRODACTYLUS, new species.

Stout. Rostrum about as long as carapace, it may be a little longer or a little shorter, overreaching a little the antennal scale; straight in basal half, slightly inclined upward in distal half; armed above with 9 to 15 teeth, 3 of which are on the carapace, 3 to 5 below, tip usually bifid; posterior dorsal tooth more remote from the others; the anterior tooth may be remote from the others or remote from the tip. Only large specimens have 13 to 15 teeth above; the usual number is 10 to 12. Antennular peduncle reaching to distal

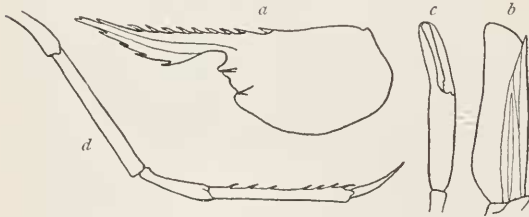


FIG. 24.—PALÆMON MACRODACTYLUS: *a*, CARAPACE, $\times 1\frac{2}{3}$;
b, ACICLE, $\times 2\frac{2}{3}$; *c*, CHELA OF SECOND PAIR, $\times 2\frac{2}{3}$; *d*, FOOT
OF THIRD PAIR, $\times 3\frac{1}{3}$.

fourth of scale; antennal peduncle to end of first antennular segment. Filaments of outer flagellum of antennula united for from 7 to 9 joints; short filament much longer than the basal portion. Acicle oblong, very broad at extremity.

Outer maxillipeds reaching beyond antennal peduncle by at least two-thirds of the last segment. The first pair of feet, extended, touch the end of the scale; the carpus is one and two-thirds times as long as the chela; the palm is a little longer than the fingers. The second pair of feet may exceed the scale by the length of the chela and part of the wrist. The carpus is subequal to the merus, exceeds the manus in length, and is distally enlarged. Palm compressed, broader than carpus, longer than fingers. The last three pairs of legs are very nearly of a length, the fifth pair attain the end of the scale; the dactyli of the third pair are contained twice or two and a half times, of the fifth pair about three times, in their propodi.

The sixth segment of the abdomen is half as long as the carapace (rostrum excluded), and three-fourths as long as the telson, which has two pairs of lateral spinules, and at the extremity a short median and lateral spine and a very long intermediate spine.

Dimensions.—Female with ova: Length, 55 mm.; length of carapace and rostrum, 23.7 mm.; length of rostrum, 12.7 mm.

Localities.—Aomori, Rikuoku (type locality, Cat. No. 26162); Matsushima, Rikuzen; Nagasaki, Hizen. Also collected by P. L. Jouy in Korea, at Fusan, Gensan, and Chemulpo.

This species in appearance much resembles *P. serrifer*, but differs in having, as a rule, more rostral teeth, broader acicle, longer fingers of second chelipeds, longer dactyls of last three pairs. In the young the rostrum may be a little convex above, the palm and fingers of the second pair subequal.

PALÆMON PACIFICUS (Stimpson).

Leander pacificus STIMPSON, Proc. Acad. Nat. Sci. Phila., XII, 1860, p. 40, [109].—DE MAN, Notes Leyden Mus., III, 1881, p. 137.

Rostrum extending beyond antennal scale for about one-third of its length, strongly upturned toward its extremity, armed with 7 to 8 teeth above (2 or 3 on carapace), 4 or 5 below, tip usually trifid.

The filaments of the outer flagellum of the antennulæ are united for from 10 to 12 joints; the free end of the short filament has 28 to 36 joints; its outer margin or that which fits against the longer filament is strongly serrate.

Otherwise this species is much as in *P. affinis* Milne Edwards.

Misaki, Sagami; Wakanoura, Kii; Nagasaki, Hizen.

BITHYNIS NIPPONENSIS (de Haan).

Palaemon nipponensis DE HAAN, Fauna Japon., Crust., 1849, p. 171.

Palaemon nipponensis ORTMANN, Zool. Jahrb., Syst., V, 1891, p. 713, pl. XLVII, figs. 4 and 4z, and synonymy.

Wakanoura, Kii; Chikugo River, Kurume, Chikugo; Kurume, July 23 (many specimens).

BITHYNIS LONGIPES (de Haan).

Palaemon longipes^a DE HAAN, Fauna Japon., Crust., 1849, p. 171.

Palaemon longipes ORTMANN, Zool. Jahrb., Syst., V, 1891, p. 715.

Kawatana, July 22 (many specimens); Nagasaki, Hizen.

The two foregoing species are very closely related; they may be separated by the following characters, which are not absolutely constant:

In *B. nipponensis* the rostrum is usually nearly straight and bears 12 or 13 teeth above; in *B. longipes* it is usually more arched and has 10 or 11 teeth above.

In *B. nipponensis*, adult, the fingers of the second cheliped are

^a I have given a new name, *Palaemon ortmanni*, to *P. longipes* (Ortmann) = *Leander longipes* Ortmann, not *P. longipes* de Haan. There is in the U. S. National Museum a specimen of *P. ortmanni* from Tsuchima Island, Japan, collected by P. L. Jouy.

nearly as long as the palm, very hairy, the teeth at their base small and concealed in hair; in *B. longipes*, adult, the fingers are only one-half as long as the palm, very little or not at all hairy. There is one well-developed tooth near the base of the pollex and two either side of it near the base of the dactylus.

In *B. nipponensis*, young, the fingers are longer than the palm; in *B. longipes*, young, they are nearly as long as the palm.

Order STOMATOPODA.

ODONTODACTYLUS SCYLLARUS (Linnæus).

Cancer scyllarus LINNÆUS, Syst. Nat., 10th ed., I, 1758, p. 633.

Odontodactylus scyllarus BIGELOW, Proc. U. S. Nat. Mus., XVII, 1894, p. 496, and synonymy.—BORRADAILE, Proc. Zool. Soc. London, 1898, p. 36, pl. v, fig. 6, and synonymy.

Wakanoura, Kii; one male.

The dactylus and distal end of propodus of the raptorial limb are bright red in the specimen preserved in alcohol.

LYSIOSQUILLA LATIFRONS (de Haan).

Squilla latifrons DE HAAN, Fauna Japon., Crust., 1849, p. 222, pl. LI, fig. 3.

Lysiosquilla (Coronis) latifrons MIERS, Ann. Mag. Nat. Hist. (5), V, 1880, p. 10.

Lysiosquilla latifrons BIGELOW, Proc. U. S. Nat. Mus., XVII, 1894, p. 503.

Nagasaki, Hizen; one female.

Length from tip of rostrum to end of telson 64.4 mm.; length of carapace 14.5 mm.

The dactylus of the right raptorial limb in de Haan's figure has 6 teeth, of the left limb 7 teeth; in our specimen the dactyli of both limbs have 6 teeth.

The posterior margin of the telson is armed with 12 small spines on one side of the sinus, 11 spines on the other side.

CHLORIDELLA *a* FASCIATA (de Haan).

Squilla fasciata DE HAAN, Fauna Japon., Crust., 1849, p. 224, pl. LI, fig. 4.—MIERS, Ann. Mag. Nat. Hist., (5) V, 1880, p. 29.—BROOKS, Challenger Rept., XVI, Stomatopoda, 1886, p. 37, pl. III, figs. 4, 5; pl. II, fig. 8.—BIGELOW, Proc. U. S. Nat. Mus., XVII, 1894, p. 510.

Tsuruga, Echizen, 2 males; Nagasaki, Hizen, 1 male, 1 female.

The intermediate denticles of the margin of the telson are either 8 or 9.

The largest specimen measures 76.5 mm. long; carapace, 19 mm. long.

^aIn 1899 (Jour. Inst. Jamaica, II, p. 628), I called attention to the fact that the name *Squilla* J. C. Fabricius, 1793, was preoccupied for a genus of Amphipoda by O. F. Müller, 1776 and 1788, by Scopoli, 1777, and by O. Fabricius, 1780. The only available name for the stomatopod genus is *Chloridella* Miers, 1880. One who considers *Chloridella* generically distinct from *Squilla* J. C. Fabricius should substitute a new name for the latter.

CHLORIDELLA RAPHIDEA (Fabricius).

Squilla harpax DE HAAN, Fauna Japon., Crust., 1849, p. 222, pl. LI, fig. 1.

Squilla raphidea BIGELOW, Proc. U. S. Nat. Mus., XVII, 1894, p. 535, and synonymy.

Wakanoura, Kii: 5 specimens.

CHLORIDELLA AFFINIS (Berthold).

Squilla oratoria DE HAAN, Fauna Japon., Crust., 1849, p. 223, pl. LI, fig. 2.

Squilla affinis BIGELOW, Proc. U. S. Nat. Mus., XVII, 1894, pp. 537 and 538, fig. 22, and synonymy.

Aomori, Rikuoku; Same, Rikuoku; Tokyo; Tsuruga, Echizen (abundant); Wakanoura, Kii (abundant); Onomichi, Bingo; Nagasaki, Hizen.

CHLORIDELLA COSTATA (de Haan).

Squilla costata DE HAAN, Fauna Japon., Crust., 1849, p. 223, pl. LI, fig. 5.—

MIERS, Ann. Mag. Nat. Hist., (5), V, 1880, p. 21.—BIGELOW, Proc. U. S. Nat. Mus., XVII, 1894, p. 511.

Wakanoura, Kii, 2 specimens, male and female; Nagasaki, Hizen, 3 males.

The surface of the carapace is tuberculate, especially between the median and submedian carinae, the tubercles more or less confluent. The marginal denticles of the telson are 3-4, 6-8, 1.

The largest specimen measures 87 mm. long; carapace, 22.5 mm. long.